



5693

5693
SPECIAL RED
TUBE

SHARP-CUTOFF PENTODE

Intended for critical industrial applications where 10,000-hour life, extreme uniformity, rigid construction, and exceptional stability are paramount. Within its ratings, the 5693 may be used to replace its receiving-tube counterpart, type 6SJ7.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage. 6.3 $\pm$ 5%* . . . ac or dc volts

Current. 0.3 amp

Direct Interelectrode Capacitances:^o

	<u>Min.</u>	<u>Av.</u>	<u>Max.</u>	
Grid to Plate.	-	-	0.005	$\mu\mu\text{f}$
Input.	4.8	5.3	5.8	$\mu\mu\text{f}$
Output.	5.6	6.2	6.8	$\mu\mu\text{f}$

* May deviate $\pm$ 10% from rated value provided such deviation occurs for less than 2% of the operating time.

^o With shell connected to cathode.

Mechanical:

Mounting Position. Any

Maximum Overall Length. 2-5/8"

Seated Length. 1-31/32" $\pm$ 3/32"

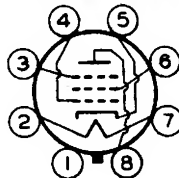
Maximum Diameter. 1-5/16"

Bulb. Metal Shell MT-8

Base. Small-Wafer Octal 8-Pin,
Non-Hygroscopic

Basing Designation for BOTTOM VIEW. 8N

Pin 1-Shell
Pin 2-Heater
Pin 3-Grid No.3
Pin 4-Grid No.1



Pin 5-Cathode
Pin 6-Grid No.2
Pin 7-Heater
Pin 8-Plate

INDUSTRIAL SERVICE

Includes applications such as dc and resistance-coupled amplifiers

Maximum Ratings, Absolute Values:

DC PLATE VOLTAGE. 300 max. volts

DC PLATE-SUPPLY VOLTAGE. 330 max. volts

DC GRID-No.3 (SUPPRESSOR) VOLTAGE:

Negative bias value. { 0 min. volts
-100 max. volts

DC GRID-No.2 (SCREEN) VOLTAGE[▲]. 125 max. volts

DC GRID-No.2-SUPPLY VOLTAGE. 330 max. volts

[▲]: See next page.

MAR. 15, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

5693



5693

SHARP-CUTOFF PENTODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:

Negative bias range. -1[■] min. to -50 max. volts

Negative peak value. -50 max. volts

DC CATHODE CURRENT 10 max. ma

PLATE DISSIPATION. 2 max. watts

GRID-No.2 DISSIPATION. 0.3 max. watt

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 100 max. volts

Heater positive with respect to cathode. 100 max. volts

AMBIENT TEMPERATURE RANGE. -55 to +90 °C

Maximum Circuit Value:

See curve on a following page giving maximum values of the grid-No.1 resistor.

Characteristics and Range Values:

Heater volts, 6.3; Plate Volts, 250; Grid-No.3 Volts, 0;
Grid-No.2 Volts, 100; Grid-No.1 Volts, -3.

	Min.	Average	Max.	
Heater Current	0.275	0.300	0.325	amp
Heater-Cathode Current with heater-cathode voltage of ± 100 volts	-	-	5	μ amp
Plate Current.	2.3	3.0	3.7	ma
Plate Current for grid-No.1 voltage of -7.5 volts. . .	2	30	80	μ amp
Plate Current for grid-No.3 voltage of -70 volts . . .	150	450	750	μ amp
Grid-No.2 Current.	0.60	0.85	1.10	ma
Reverse Grid-No.1 Current. .	-	-	0.1	μ amp
Plate Resistance	1.0	-	-	megohm
Transconductance	1400	1650	1900	μ mhos

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No.20 at front
of Receiving Tube Section.

- ▲ The 5693 may be operated at a grid-No.2 voltage as high as the rated grid-No.2 supply voltage when the grid-No.2 dissipation rating is not exceeded for any signal condition and when a resistor is used in series with grid-No.2 and its supply voltage.
- For resistance-coupled amplifier applications, the grid-No.1 negative bias may be as low as -0.5 volt.

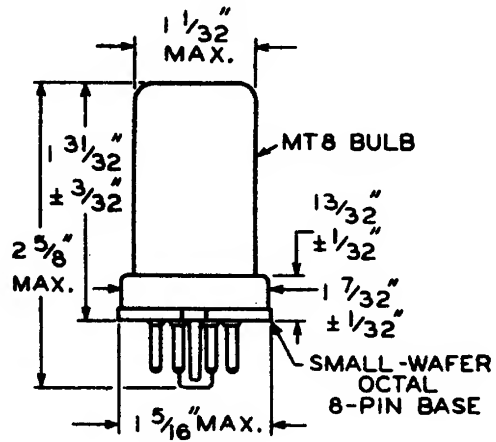
MAR. 15, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA



SHARP-CUTOFF PENTODE



MAR. 15, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

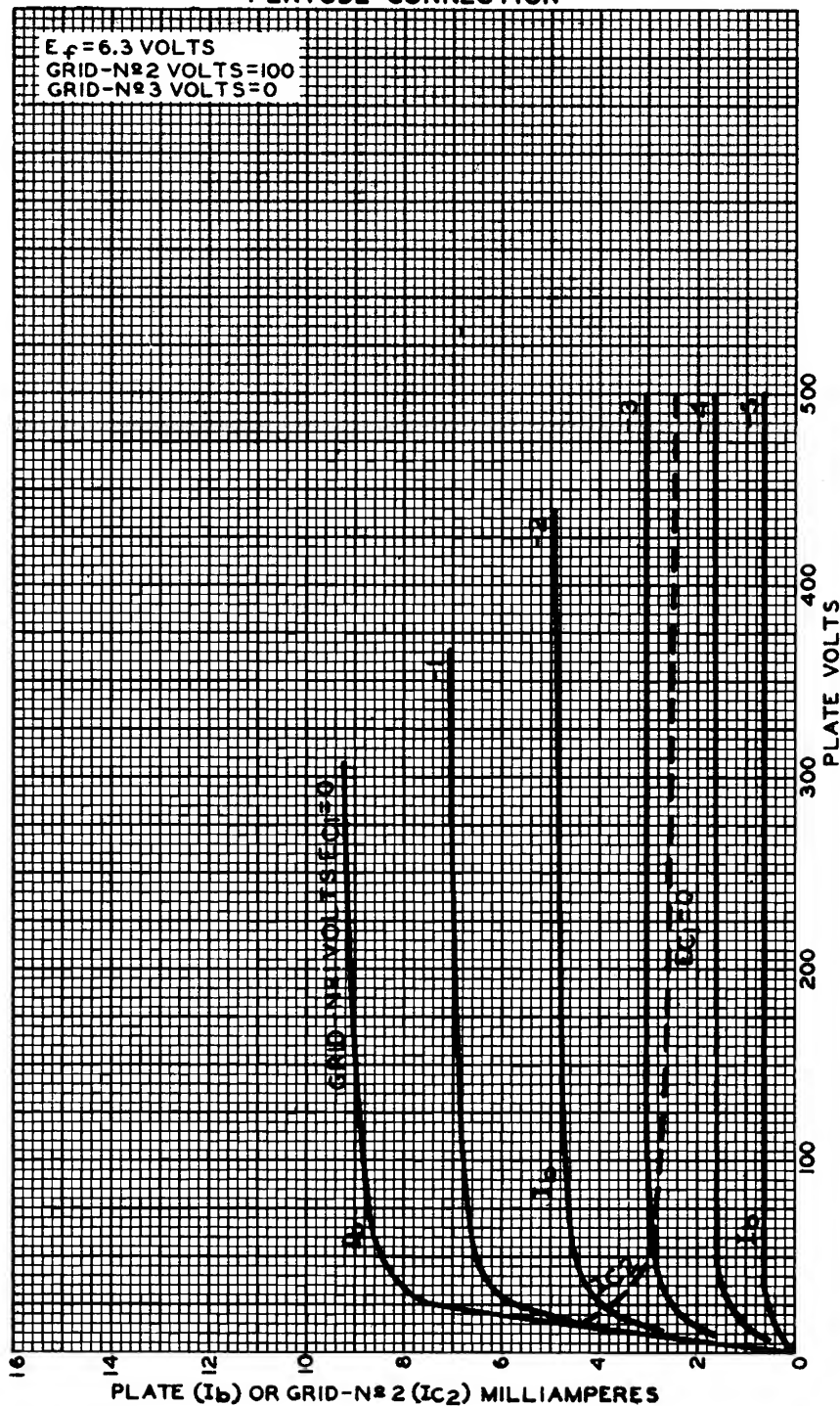
OUTLINE

5693



5693

AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION



OCT. 16, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4939R1



5693

5693

OPERATION CHARACTERISTICS

 $E_f = 6.3$ VOLTS PLATE VOLTS = 300 GRID-N $\circ$ 3 VOLTS = 0

CURVE	GRID-N $\circ$ 2 RESISTOR	GRID-N $\circ$ 2 SUPPLY VOLTS
1	0 MEG.	100
2	0.25 MEG.	300
3	0.5 MEG.	300
4	0.75 MEG.	300

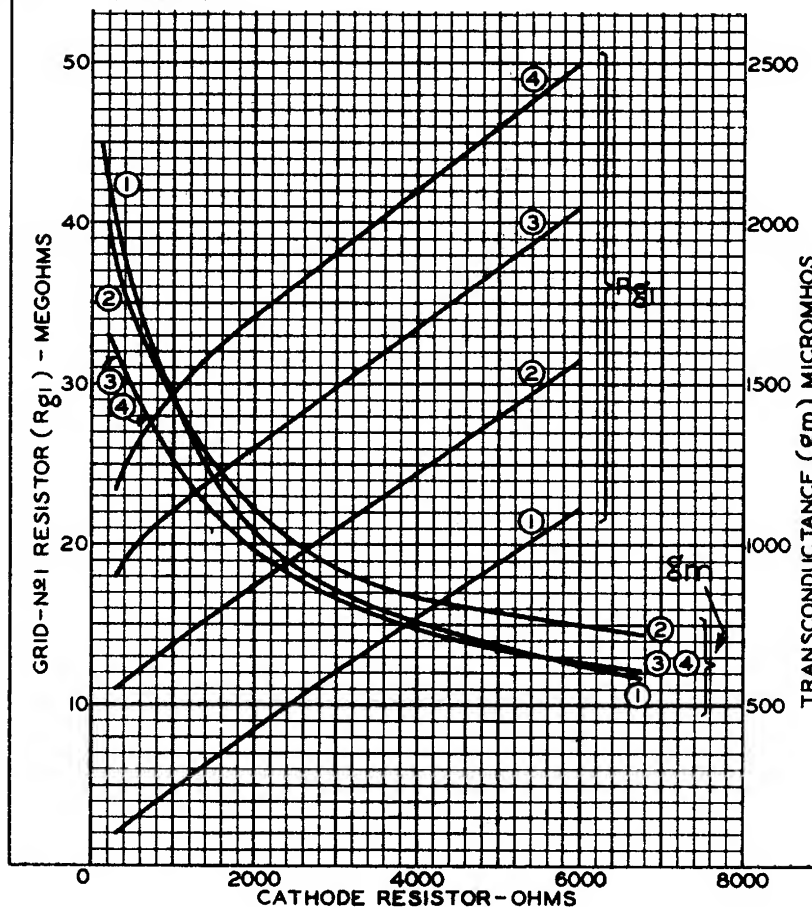
THESE CURVES ARE BASED ON THE FOLLOWING VALUES:
 $\Delta I_K = 300 \mu\text{AMP}$, $\Delta I_{g1} = 0.1 \mu\text{AMP}$

EXPRESSING THESE VALUES AS A RATIO, WE HAVE:

$$\frac{\Delta I_K}{\Delta I_{g1}} = \frac{300}{0.1} \text{ OR } 3000$$

FOR THOSE APPLICATIONS PERMITTING OTHER VALUES OF ΔI_K , A NEW RATIO OF $\Delta I_K / \Delta I_{g1}$ CAN BE CALCULATED. THE VALUES OF R_{g1} AS READ FROM THE CURVE MUST BE MULTIPLIED BY A FACTOR WHICH IS THE QUOTIENT OF THE NEW RATIO DIVIDED BY THE OLD RATIO. FOR EXAMPLE, IF THE NEW RATIO IS 6000 THE MULTIPLYING FACTOR IS $6000/3000$, OR 2, AND VALUES OF R_{g1} AS READ FROM THE CURVE ARE THEREFORE MULTIPLIED BY 2.

NOTE: TRANSCONDUCTANCE CURVES WERE OBTAINED WITH GRID-N $\circ$ 2 RESISTOR AND CATHODE RESISTOR SUITABLY BYPASSED.



JAN. 6, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6920R1

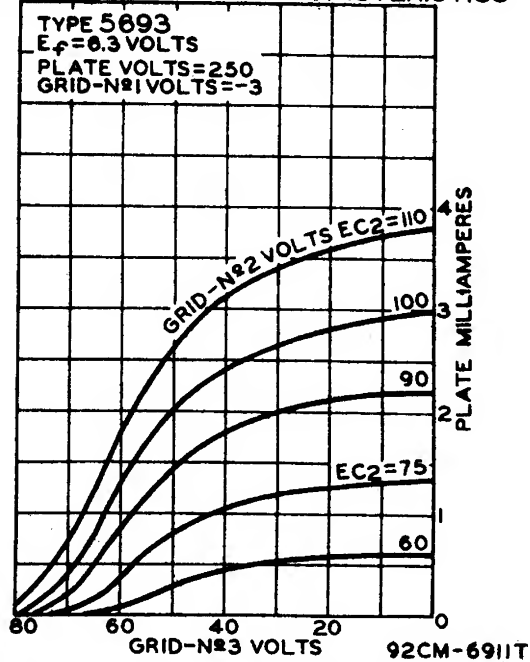
5693



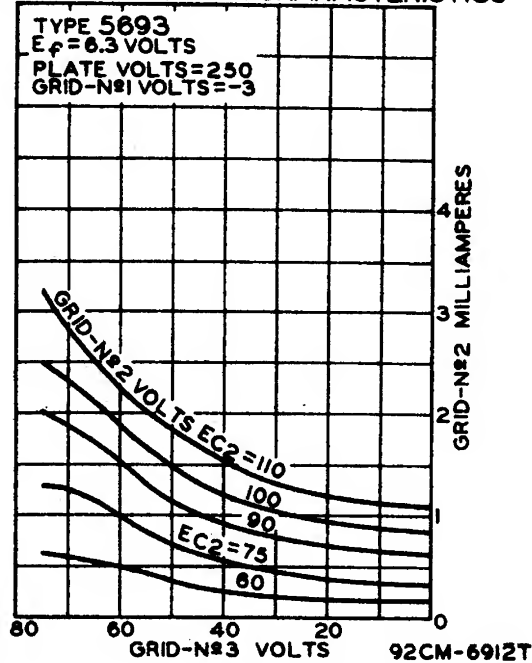
5693

SHARP-CUTOFF PENTODE

AVERAGE SUPPRESSOR CHARACTERISTICS



AVERAGE SUPPRESSOR CHARACTERISTICS



MAR. 15, 1948

TUBE DEPARTMENT
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

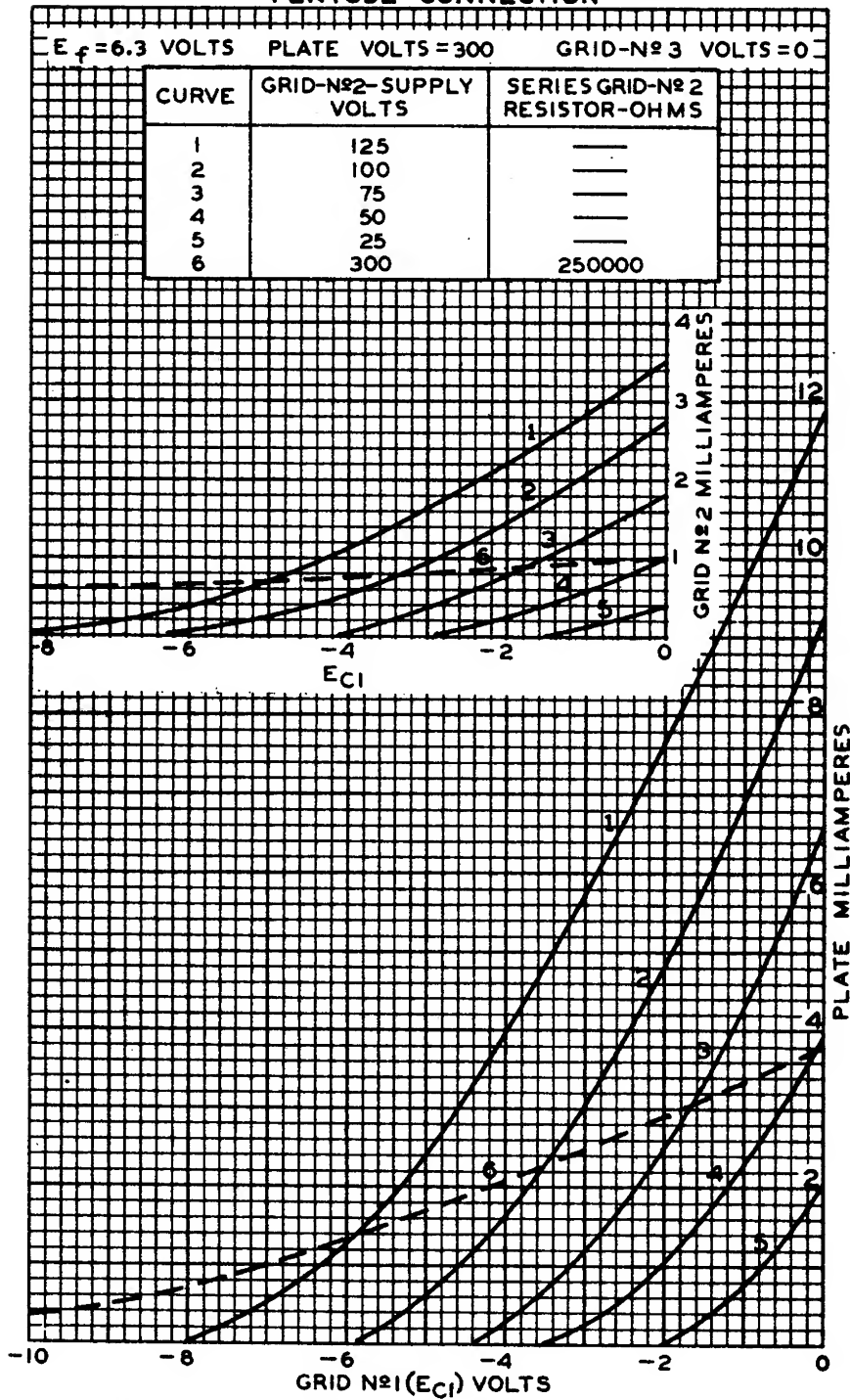
CE-6911T-6912T



5693

5693

AVERAGE CHARACTERISTICS PENTODE CONNECTION



MARCH 5, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6443RI

5693

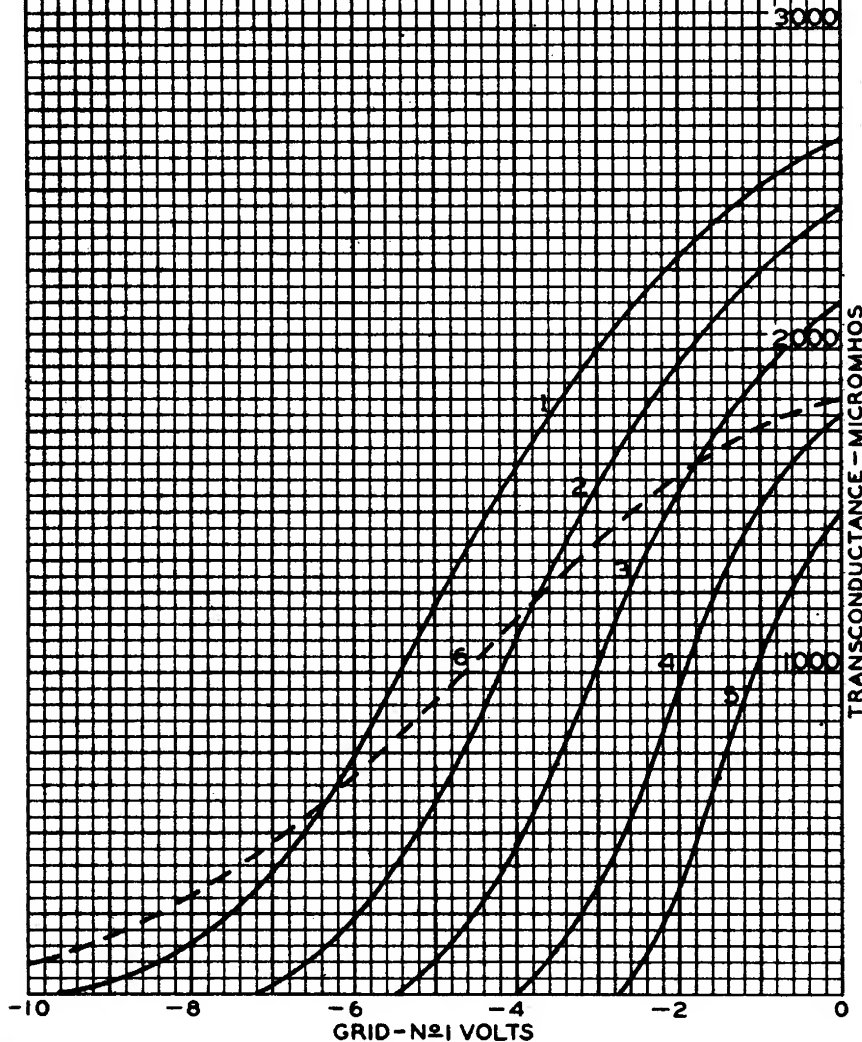


5693

AVERAGE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$ VOLTS PLATE VOLTS = 300 GRID-Nº 3 VOLTS = 0

CURVE	GRID-Nº 2-SUPPLY VOLTS	SERIES GRID-Nº 2 RESISTOR-OHMS
1	125	—
2	100	—
3	75	—
4	50	—
5	25	—
6	300	250000



MARCH 5, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

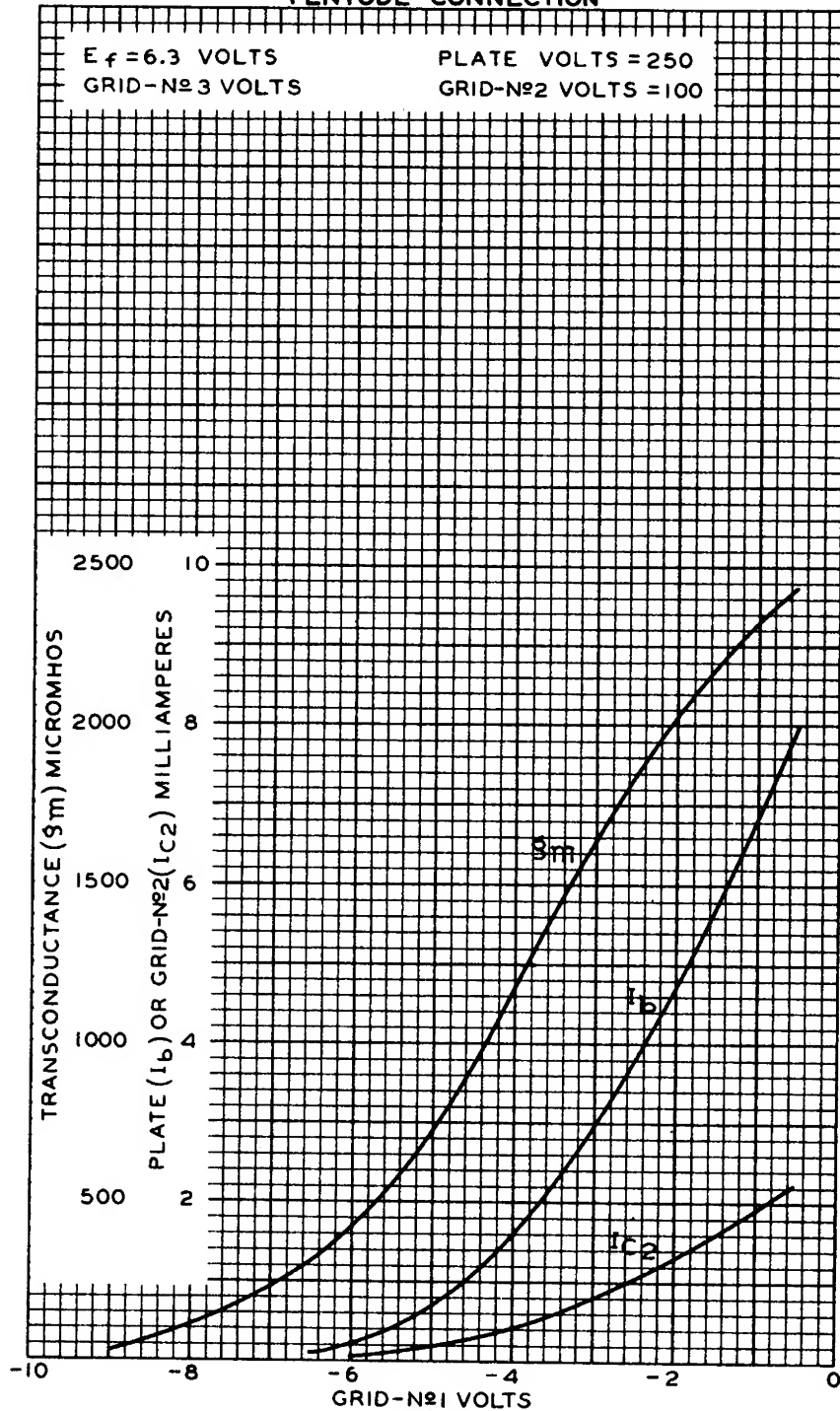
92CM-6444R1



5693

5693

AVERAGE CHARACTERISTICS PENTODE CONNECTION



MARCH 5, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4937R1